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THE UNIVERSITY OF ALBERTA

THE EFFECT OF A SIMULATION GAME ON VOCATIONAL MATURITY

by

© DIANE STAMMER

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF EDUCATION IN EDUCATIONAL PSYCHOLOGY

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THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled The Effect of a Simulation Game on Vocational Maturity submitted by Diane Stammer in partial fulfillment of the requirements for the degree of Master of Education.

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Date 27 July 1977

ABSTRACT

The present study was carried out to test the effectiveness of the Life Career game in increasing vocational maturity scores. A total of eighty-three grade eleven students were administered the Career Development Inventory High School Form III as a pre and post-test measure. Forty-five of these students participated in the playing of Life Career for thirteen fifty-minute sessions, completing eight rounds per team. The results were analyzed using a three-way analysis of variance. Pre-test means between the experimental and control groups were not significant ($t = .14$; $df = 81$, $p > .20$), suggesting that the two groups were similar in their responses to the CDI. Following the experiment, however, significant main treatment effects were obtained ($F = 73.17$; $df = 1, 75$; $p < .00001$). These results suggest that the Life Career game was an effective tool to use for the teaching of vocational information, as significant increases in vocational maturity were found.

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CHAPTER I

INTRODUCTION

Introduction

Vocational education has changed from a narrowly oriented occupation view to one of career education which is seen as a series of developmental experiences leading to a life pattern. William Bingham (1974) perceives career education's fundamental concern to be self-actualization with the beginning point being self awareness, progressing toward a purposeful pattern. Vocational psychologists view the concept of vocational maturity as a developmental process, a transaction between the organized environment an an organism with an inherently orderly growth potential. (Harris, 1974). This developmental process becomes the theoretical basis for the organization of vocational programs.

Vocational maturity is seen by Donald E. Super as a continuous process whereby the individual moves from a base in fantasy to a base in reality. This final transition between fantasy and reality occurs in the period between the end of high school and the beginning of work. Therefore, a high degree of vocational maturity should be attained by high school students. When vocational maturity is developed to a high degree, the occupational information an individual has increases in relevance, reliability, and specificity, and is used more often as a basis for decision. (Super and Overstreet, 1960).

High school students are seen as being in various stages of vocational development when viewed by Super's theory. Some are ready

to crystallize plans, some to specify goals, and some to implement a preference. (Jordaan, 1974). Many are not so highly developed, lacking the information and experience to make informed choices. (See Appendix C for an example.) Individual learning experiences must be provided for these students so their vocational development will flourish.

Vocational guidance, as Super defined it, is centered on the idea that "the process is one of helping a person to develop a picture of himself and of his role in the world of work, to test this concept against reality, and to convert it into a reality, with satisfaction to himself and benefit to society." (Super, 1951, p.88).

The counselor's function in a school setting must be seen as one of facilitator of decisions which are based on sound reasoning and knowledge. They should be seen as developers of decision-making skills in students. Clarke, Gelatt, and Levine (1965) discuss the counselor's role in vocational guidance and suggest that greater efforts be made to determine what specific information is relevant to the decisions faced by the high school students, and to gather and organize that information so students can use it effectively.

Statement of the Problem

The problem appears to be one of presenting vocational information and guidance to high school students who are in need of highly individualized programs because of their varying levels of vocational maturity. A program which could be used effectively with both sexes would be best suited to a school environment as no segregation of classes would have to occur. Although the job of disseminating information and implementing programs is often seen as being solely the job of the school counselor, further involvement on the part of staff

and students should be encouraged in order to meet the needs of the students.

Purpose of the Study

The purpose of this study was to investigate the effectiveness of a simulation game called Life Career in presenting vocational information to groups of students. This simulation game presents information in a way that is conducive to student interaction and motivation and implementation of it would be one way of coping with the problems previously mentioned. Vocational skill-building experiences are provided.

The effectiveness and utility of the program would be evaluated by its ability to increase student's scores on a test of vocational maturity. The game participants and a control group would be given a pre-test and after the experimental group received the program, post-tests would be given to both groups. The results would then be analyzed. The criteria measure to be used was the Career Development Inventory High School Form III, developed by Donald E. Super in 1976 after revisions were made on the 1971 edition of Form I. This measure has been developed as an evaluator of vocational programs, and should prove to be effective in measuring the usefulness of Life Career as a teaching tool in vocational guidance.

Limitations of the Study

The sample to be used in this study was comprised of grade eleven students from Paul Kane High School in St. Albert, Alberta. The total number of students to be used was eighty-three, forty-five of whom will participate in the playing of the simulation game, and thirty-eight of whom will act as a control group. This sample may not be typical of the population of grade eleven students in Alberta, or in Canada.

The Career Development Inventory High School Form III has, as of yet, remained an unpublished measure. Since its development in 1976 from the original Form I (1971), no published studies of the reliability and validity of this instrument have resulted; only results from the original form exist and have been cited.

It is for these reasons that readers should exercise prudence when generalizing from the results obtained here.

Definition of Terms

For the purpose of this study, the following definitions are used:

1. Vocational Maturity: As defined by Super and Overstreet (1960), vocational maturity is:

> "the life stage the individual actually is in, as evidenced by the developmental tasks with which he is dealing, in relation to the life stage he is expected to be in, in terms of his age." (p.8)

2. Game: The term implies competition among participants and yielding to a winner.

3. Simulation: As defined by Dawson (1962), a simulation is:

> "the construction and manipulation of an operating model, that model being a physical or symbolic representation of all or some aspects of a social or psychological process (p.3).

4. Simulation Game: As defined by Coleman (1968), a simulation game is:

> "a game in which certain social processes are explicitly mirrored in the structure and functioning of the game. The game is a kind of abstraction of these social processes making explicit certain of them that are ordinarily implicit in our everyday behavior (p. 30).

CHAPTER II

REVIEW OF RELATED LITERATURE AND RESEARCH

In this chapter the various subject areas which are of importance to this study are examined. The areas to be reviewed are: development and characteristics of simulations, studies related to the Life Career game, studies related to the concept of vocational maturity, and studies related to the criterion instrument chosen.

Research Related to Development and Characteristics of Simulations

Historical Development of Simulations

The first known use of games for serious purposes was in "war gaming". The harmless aspect of this was its major advantage, the others being the benefits it gave to armies in terms of research and training. Real military situations were represented and the problems of time, money, and logictics were avoided. In the nineteenth century, the German General Staff used a gaming method, and in World War II both the German and Allied troops were known to have used this method.

After World War II, the technique was applied to the business world where correct decision-making can mean the difference between financial disaster or fortune. Different decisions could be experimented with under varying conditions, and results known in several hours. Costly errors in judgment could be avoided.

Currently, serious games are being utilized for research, planning, training, and education. An example of their use in research has been in the study by governments of insurgency. Also, trans-

portation planners make numerous considerations and a game was designed for their use. Games are used in the training of military personnel for jungle warfare.

Characteristics of Educational Simulations

Recently, the use of games in the education field has widened, as it has become apparent that they have much to offer in terms of curriculum enrichment and motivation to learn. The uniqueness of games allow for dealing with complex problems in concrete ways. The desire to learn information that is relevant in the "real" world is becoming a demand students are making of educators, and serious games have one answer for that demand.

Being aware of characteristics which good educational simulations have is essential when deciding what new teaching methods to incorporate. Beck and Monroe (1969) outline four such characteristics. These include:

1. Provision of an analagous situation. Since strategies involved in the playing of a game are rather specific to it, appropriate discussion must occur so that the learning is transferable to real events outside school. As Gillespie (1972) states, the learning of the conceptual content of the game is what is important, not simply the problems the game poses.

2. Provision for low risk input. If the students see that experimentation with alternate game strategies routinely leads to undesireable consequences, learning from the game will be reduced significantly.

3. Symbolic feedback of the consequences.

4. Replicability of the gaming process.

Beck and Monroe (1969) also suggest that simulation games used in

education should have six dimensions, including:

1. Reality - Reality is developed through content, process, time, and vehicle. Content of the game and the gaming process relate to the relevance of the curriculum as the student perceives it. The time deviations which the game allows for, the contradictions or expansions, should accelerate learning. The vehicle of the game will vary from abstract symbols to the totally operative environment.

2. Complexity - The game would have various consequences for the learner, various response choices open, and constraints on time.

3. Curriculum content - Use of a game should be determined by the learning objectives, the characteristics of the learner, and the designer's intentions as to its use.

4. Availability of model design, including the model source and identity of designer.

5. Replicability - Identical trials should be allowed for one or a series of players.

6. Evaluation - The user should be concerned with the criteria of learning as measures of student achievement and efficiency of a game as a learning medium.

In her analysis and evaluation of classroom games, Gillespie (1972) suggested that the decision as to how good a game is for your purpose as an educator should be based on the strength of the game's knowledge base. All simulation games for classroom use have this base, and it is identified by asking questions concerning the choices and moves available and the organization of the game. The base is built on the problem statement, "What is the central problem presented?" Essential concepts are then transformed into rules, organized

in an effective way so players learn the basic concepts. These criteria serve the purpose of enabling the user to distinguish sound from unsound parts, and make a judgment of the game's total acceptability.

Barbara Varenhorst (1973) stated her belief that simulation games have their place in education because of the advantages they offer. They provide for experiential learning, and have built-in motivation. They provide training in intuition-building, problem solving, and social behaviors. They teach facts, plus the benefits and risks of alternative strategies of decision-making. They provide instruction for individual problems and capabilities. Peers teach each other and, according to needs and abilities, each learns different things on different levels in the same game.

Clark Abt reported on various educational simulation games, and in his book entitled Serious Games (1970), outlined the needs of the area. He suggested that evaluation of games include the concern of cost=effectiveness. This is determined by:

1. The amount of player identification which occurs.

2. The realism of the game. How much has it been sacrificed for playability?

3. The game's response to conscious decisions of players rather than chance.

4. The game's playability, which is the space, time, and materials required.

5. Clarity of design, which will be reflected by concise, clear rules and adequate preparatory material.

6. The number of players required. The game has not been adequately test-played if too many players are needed to interact, acquire

information, and make decisions affecting others.

7. A great amount of interaction, variablility, role playing and uncertainty of outcomes.

Abt suggested that a game used in a school setting must also fulfill other criteria. It must accomplish the purposes it was designed for. Students should become aware of the simultaneous interaction of forces, and be able to apply the information learned.

The use of games in the educational field is still in early stages. Characteristics of educational simulations have not been fully defined, and as more research is done, characteristics which will distinguish good simulation games from mediocre ones will emerge.

Research Related to Various Simulation Games

One of the first major reviews of research dealing with simulation was done by Cleo Cherryholmes (1966). She examined findings from six simulation studies: Anderson (1964), Boocock (1963), Boocock and Coleman (1966), Cherryholmes (1966), Garvey and Seiler (1966), and Robinson, Anderson, Herman, and Snyder (1966). Cherryholmes hypothesized that simulation participants would reveal more interest, retain more facts and information, acquire more critical thinking and decision-making skills, and have significantly altered attitudes. This would be in comparison to students participating in conventional classroom activities. She found that simulations do produce more student interest and motivation but found no significant differences in learning, retention, critical thinking, or attitude change.

Boocock and Coleman (1966) discussed the values of the educational games published to that date. The games are said to bring the outside world to the child's grasp allowing for various roles to be

played. They have a motivating and self-disciplining ability. The fact that they are self-judging allows the teacher to escape from the role of the judge.

The quantity of simulation research expanded from 1966 to 1971, but, as Fletcher (1971) indicates, the quality did not improve. He criticized the research as still being in its infancy stage. These reasons were cited:

1. Lack of workable games.

2. Variations in objectives, structure, subject matter, and task complexity.

3. Lack of relationship between the structure of the game and the learning objectives.

4. Lack of standardization of administrative procedures.

Fletcher questioned the claims researchers made about the learning environment created by games, including those that a game is self-judging, that the role of the teacher changes, and that the relevance of game learning is greater than other methods.

Chartier (1972) used the game Generation Gap with undergraduate students in an introductory speech class to investigate the value of discussion to maximize the simulation's learning potential. The hypothesis was that subjects who participated in the simulation plus discussion would demonstrate more learning at cognitive and affective levels than subjects participating in a simulation with no discussion, or discussion with no simulation. Chartier administered a predisposition indicator to each subject and developed an achievement test to measure levels of cognitive learning. The only significant difference between experimental and control groups was that the subjects who par-

ticipated in the simulation plus discussion demonstrated higher learning outcomes at the cognitive level than those participating in either simulation or discussion.

Evidence that simulations generate more interest and motivation than conventional class activities has been reported by Anderson (1964), Cohen, Dill, Kuehn, and Winters (1968), Shirts and Sprague (1966), and Cohen (1969). The findings of these studies and the one by Chartier may be attributed to the Hawthorne or novelty effect produced by the newness of the method.

Wentworth (1972) attempted to determine the broad impact of a simulation by the measurement of attitudinal, cognitive, and behavioral variables during participation. He used the game Marketplace to teach introductory economics in selected colleges. To measure the cognitive and affective learning effects, an investigation of student verbal behavior before the participation was conducted. Student responses were found to be more positive, co-operative, and reinforcing as the simulation progressed. Verbal behavior showed no evidence for convergent, divergent, or evaluative thinking. No additional gains in positive attitudes toward economics or carry-over into subsequent classroom interactions were found.

Goodman (1973) enumerated the research problems associated with gaming and simulation, and suggested that the fact that learning related to games takes place during and after the game experience and this obscures the problem of doing research. Much simulation literature refers to the importance of post-game discussions. Goodman suggested that reflections on this process do not terminate when the game does. There is a need for researchers to focus on the formalized

nature of simulation exercises, so data will be produced to indicate what is actually going on as decision-making occurs. The appropriate position for simulation research to assume is described by Goodman.

> "It would appear far more exciting and profitable to allow efforts to determine when (under what circumstances) gaming works with efforts to discover why it works rather than to move toward producing ever more convincing evidence that there are times when it does seen to work." (1973, p. 939)

Research Related to the Life Career Game

Sarane Boocock, the designer of Life Career, and James Coleman (1966) conducted a large-scale test of the game at a 4-H conference in Berkeley, California in 1964. They found it to be a motivating, learning experience for students. The students were noted to have acquired a feeling for the process simulated and its complexity. No attempt was made to compare the game method with other teaching methods or to control for different types of students, making the results of limited use.

Boocock (1967) reported field testing of the game in other areas including Florida, California, Pennsylvania, and Maryland. School settings were used, and she noted the most pervasive result to be the intense interest and involvement of the participants during long periods of playing time. The game appeared to be efficiently communicating factual information, but a comparison with students who were taught the same information by another method was not made. The vicarious experiences involved in the playing of the game seemed to produce both the effect of increased empathy for roles played, and an appreciation for the complexities of the decisions that lie ahead.

Boocock emphasized the versality of the game by stating that it could be a supplement to a guidance program at a number of age levels, and fit into a social studies or home economics course.

Several researchers have examined the Life Career game's effect on learning and retention of specific information. Farran (1968) had grade eight boys at North Carolina Advancement School play the game and then he measured content learning. He used two tests: one was a self-devised knowledge and applicability test, and the other was an attitues to learning measure created by the California Study Methods Survey. Farran hypothesized that there would be increased learning as a result of intergroup competition, compared to individual students who played the game. This hypothesis was rejected, leading him to postulate that for game learning the effect of status rewards from peers is more direct and powerful than from individual competition. He felt that one important experience the game provided was experience in strategic planning.

Barbula and Issac (1967) hypothesized that their experimental group (who played the game) would acquire more insight into the career selection process and more favorable attitudes toward vocational concepts. The test measures used were: a ten-item questionnaire adapted from Crites' Vocational Development Inventory, a three-item test measuring use of time, and an adaptation of Osgood's Semantic Differential Scale to obtain attitude ratings on various vocational concepts. No hypotheses were statistically significant, but Barbula and Issac suggest that this may be due to insensitive instrumentation.

Johnson and Euler (1972) studied the effect of Life Career on

the learning and retention of education-occupational information. An experimental and control group of students were used with pre and post-tests used to measure learning. They found the experimental group learned less educational information than the teacher-taught group, but they did retain more occupational information than the teacher-taught group.

Stevens (1973) investigated the effect of the game on occupational interests and aptitudes using the Kuder Preference Record, Vocational, Form C (KPR-V) and the Differential Aptitude Test (DAT) as pre and post-program indicators of interest and aptitude levels. He found no significant differences in the scores of the experimental group when compared to those of the control group. There were significant changes between the pre and post-test scores of the two groups on the KPR-V and significant changes in correlated scores between the KPR-V and DAT subscales.

Swails (1974) studied the effects of three approaches on the aptitude and attitude dimensions of vocational development of ninth grade students. The three group techniques used were: counseling, modeling, and the Life Career game. He found no significant differences in either attitude or competence scores between the treatment groups when Crites' Vocational Development Inventory was used.

Rhett (1974) was interested in the game's effect on autonomy and life career planning. His treatment groups were comprised of black senior high males. He hypothesized that the experimental group would show significant changes in the post-game autonomy score of the Adjective Check List, but this was rejected.

Varenhorst has used the Life Career game extensively in her work

with the Palo Alto School District in California. She reported particularly successful experiences when it was played by three specific groups: high ability students performing well below ability, Negro students (who were a minority group), and students who were average to below average achievers (Varenhorst, 1973).

Varenhorst (1963, 1968) suggested that the game would be a useful tool in group counseling in the schools as it denies resistance to involvement and discussion of problem areas. It allows the student to reveal his own problems, feelings, and values, yet he can hide behind the game's hypothetical profile person.

Groome (1975) used Life Career with one hundred forty-four grade eleven students from high schools in Regina, Saskatchewan. She used Crites's Career Maturity Inventory to measure the program's effectiveness in increasing the groups' vocational maturity levels. She found no increase in the maturity of the group after the simulation experience, however, the students only played for one school day, approximately four rounds per team.

The Life Career game has been used by many researchers to test various hypotheses, several dealing with the area of interest in the study to be described - the learning and retention of occupational information, and the raising of vocational maturity scores. No significant results appear to have been found, however this may be due to the shortness of the programs which were run. The game's designer suggests that at least eight rounds of play should occur for its full potential to be realized, so it is conceivable that this is the reason why the results found have not been significant.

Research Related to Vocational Maturity and Decision-Making

Vocational decision-making has been seen as a process by several authors. Gelatt (1962) called it a cyclic process, as the initial decision creates a new one which, when acted upon, leads to another decision. He believed it to be an interactional process between the decisions of the immediate, intermediate, and distant future. Super (1960) saw vocational decisions to be a series of related behaviors rather than a limited number of discrete acts. The developmental process was seen as a continuing one with the ability to perform new behavioral acts largely dependent on capabilities for behaviors which have already been developed.

By the end of high School years, the first of a series of decisions will be acted upon, although the process of deciding "what" to do has been ongoing for years. Numerous researchers have noted important influences which have some effect on the vocational decisions made by an individual. Barker (1972, p. 14) stated that the student makes choices for the future in accordance with his perceptions of the reference groups whose influences are exerted through the relationahips built up with them. Barker's research found parental influence on choice to be significant. He also found that the parent's socio-economic status and the home's location influenced choice. More urban than rural students aspired to continue their education. Within the rural setting, Slocum (1968) found that rural girls had plans similar to city girls', whereas the rural males' plans did not correspond to city males' plans. Keoyote (1971) found a positive correlation between socio-economic status and a choice of furthering studies at a university. The higher the status, the higher

the incidence of a university choice being made.

Hollender (1971) found that intellectual ability (assessed by scholastic aptitude measurements) influenced the vocational decisiveness for both males and females. A willingness to verbalize a personal vocational decision was correlated with intellectual ability.

Malik (1971) saw decision-making as being influenced by the nature and scope of the problems being faced by the individual in the past. The ability to make a choice will depend on the various strategies he has employed to solve earlier problems. Ability to choose, therefore, is different for each individual. Differences in child rearing, schooling methods, and the absence or presence of appropriate environmental models, as well as the previously mentioned intellectual ability, value systems, will all have a certain degree of influence on the decision that is made.

Tiedeman and Field (1968) saw a relationship between career decision-making and personality. Personality differences can be discussed in terms of the particular pattern of alternate future situations which various individuals have predicted and chosen to pursue above all else. Choices can be predicted from the personality characteristics as revealed by sex role and family role identification, and self concept. Osipow, Wall, and Ashby (1966) also believed that personality affects choice. They predicted that subjects would express occupational preferences consistent with their major personality orientation. Research results supported their prediction.

Korman (1966) reported another influence on vocational choice, that being self-esteem, as reported by clients. The individuals with high self-esteem (characterized by a sense of personal adequacy)

made vocational choices congruent to self-perceived characteristics. His 1969 study found that the "high self-esteem individuals were more likely to seek self-fulfillment in the realm of occupational behavior than were those with low self-esteem." (p. 192)

Anyone preparing to make a vocational decision has certain needs which, when fulfilled, enable him to make a choice. The individual must have occupational information in order to reach that point. Clarke, Gelatt, and Levine (1965, p. 41) said a decision maker needed adequate vocational information relevant to him and organized in such a way that it may be used effectively. An individual also needed information on alternative actions, and the possible outcomes of these various actions. The relationship between actions and outcomes ought to be studied and the individual should have a preference in mind for the outcomes.

Gelatt, (1962) believed that a decision will be made only when a willingness is shown to accept responsibility for the consequences of an action. Marr (1965, p. 405) said a decision maker needed an adequate role model to learn healthy ways of dealing with life and the problems he will be faced with solving.

Cover (1969) studied the relevance of vocational maturity to career decision-making. The results indicated that it was related to an ability to make post-high school decisions, the belief that events have meaning, and the feeling that events can be controlled. Dilley (1965) studied high school seniors and found vocational maturity to reflect an increase in planning activities, the acceptance of responsibility, and a general concern about the making of good decisions.

The Career Development Inventory

There is a definite lack of research available on the use and effectiveness of the Career Development Inventory (CDI). What does exist is discussion of the instrument as one which follows the theoretical concepts of Super on vocational maturity, found in his book on the maturity of ninth grade boys (1960) and in his later writings. Several authors discuss the use of the CDI as an evaluatory measure of vocational programs, but no research has as yet been published in which the CDI High School Form III (devised in August of 1976 as an expansion of Form I) was used.

LoCascio (1974) discussed the instrument's development from the beginnings of the Career Pattern Study to its 1971 appearance as a separate measure of vocational maturity.

Hilton (1974) evaluated the CDI and other vocational maturity measures by classifying the item content of the inventory into the areas of self-awareness, educational awareness, career awareness, decision-making, beginning competency, and employability skills. He found the emphasis of the CDI to fall between career awareness and decision-making. Hilton suggested the use of the CDI as an evaluatory measure of any vocational program whose objectives include the development of skills in vocational exploration and in decision-making, developing awareness of available options, and the need to plan.

Jordaan (1974) reviewed the CDI as an instrument to measure vocational maturity, discussing its use as a diagnostic tool for counselors. He presented several student profiles of results from the Inventory and suggested how the results might be interpreted to the

student. The advantages of using a theoretically derived vocational maturity measure are that it allows the counselor to direct and focus inquiry, to organize observations, to assess a client's needs, problems, and possibilities, and to formulate counseling objectives and procedures.

Super (1974) reviewed the material obtained on vocational maturity and concluded that the CDI is worthy of use by the counselors as a means of assessing a student's readiness for exploration, trial experiences, and decision-making.

Arni (1976) used the CDI High School Form I as the pre and post-test measure to evaluate his Vocational Exploration Unit. His criterion for the program's success was an increase in the post-test scores showing that the vocational maturity level of the students had increased, in comparison to to the control group's change in scores.

It is obvious that more research on the CDI needs to be done. Although studies on the instrument's reliability and validity have been reported (Forrest, 1971), its use as a measure to evaluate vocational programs has not been widespread., yet it appears that the very thing the instrument was designed for was program evaluation. Researchers should be encouraged to use this measure, possibly one of several instruments to be used, so more empirical data can be presented, and its use justified.

Summary

Although games have existed for many years, serious games to be used in field of education have only recently been developed. When a game can be developed which fulfills the criteria demanded of it

by educators, advantages it has over other teaching methods will be noted. Specifically, these advantages are: the game's ability to sustain a high degree of interest and motivation in the students, the shared learning and teaching among peers, and the provision of individual need satisfaction. Currently, many research problems exist in the simulation field as learning does not appear to end with the close of game playing activity, and ways of measuring this learning and retention must be developed.

The Life Career game, developed by Sarane Boocock, is one simulation game which has fulfilled the criteria demanded of an educational game. Various researchers report success with it at the high school level when used as an aid to the dispensing of occupational information.

The concept of vocational maturity was discussed as it related to high school students. It was seen to be comprised of many variables and influenced by several factors. Several measures of voctional maturity have been developed, including the Career Development Inventory, the criterion instrument chosen for use in this study.

CHAPTER III

PROCEDURE AND DESIGN

The Hypothesis

The aim of this study was to test the hypothesis that the Life Career game participants would show significantly higher scores on the post-test of the Career Development Inventory High School Form III than the control group.

The Collection of Data

The author obtained permission from the St. Albert Protestant Separate School District #6 to have high school students from two classes of Psychology 20 at Paul Kane High School participate in the study. St. Albert is a city of 25,000 people, situated five miles north of Edmonton, Alberta. The city is comprised of mainly middle class families with many adults employed in professional occupations. In the majority of families, both parents are employed.

Population and Sample of the Study

The sample of grade eleven students who were involved in the project were drawn from a total school population of 1,050 with the grade eleven population being 310. The experimental group was comprised of twenty males and twenty-five females registered in the second semester of a Psychology 20 option class. The control group was comprised of fourteen males and twenty-four females registered in the second semester of a Sociology 20 class. All students were registered as being in the eleventh grade.

The age of the students ranged from 16 to 18. Table I gives the ages of the girls and boys in each group.

TABLE I

DISTRIBUTION BY AGE OF SUBJECTS

SEX	AGE: 16	17	18	TOTAL
EXPERIMENTAL GROUP				
MALES	11	7	2	20
FEMALES	13	12	0	25
CONTROL GROUP				
MALES	4	8	2	14
FEMALES	10	14	0	24
				83

The male groups have a wider age range, but the groups are almost evenly distributed at the sixteen and seventeen year age level.

Procedures of Experiment

A trial run of the game playing, including rule explanation and scoring, was done so that the appropriateness of the game for the experimental group could be determined. Two weeks before the program was to begin, a team of four male grade eleven students played the game during lunch hour for five consecutive school days. The explanation of the rules was standardizated for future use with the experimental group, and any problems which became apparent as the game progressed were dealt with in these practice sessions.

The experiment was conducted at Paul Kane High School in St. Albert by the author, with the aid of two teachers of Psychology, one being the school's counselor, the other a teacher of Psychology and History. The

program ran from April 18th til May 6th, 1977, inclusive. All subjects in the experimental and control groups completed the pre-test, the Career Development Inventory, High School Form III, on the same day during class time. Both groups were given the same information regarding the testing; the inventory was not a test as you could not pass or fail, and the results are helpful to both the counselors and the students as they give an indication of the level of the vocational maturity reached. The concept of vocational maturity was defined for the groups.

The students in the experimental group had not completed any unit thus far on vocational planning, so it was assumed that any prior information they had was obtained from contacts with counselors, parents, siblings, friends, or through work experience.

The Life Career game was introduced to them on the second day as the first activity in a unit of vocational planning which they would study in their daily class of fifty minutes. The students were then requested to form groups of three. No attempt was made to divide the subjects into groups according to their level of vocational development, sex, or aptitude. Several groups of four and of two were formed as the class sizes were uneven. Folders were passed out which contained copies of the information needed to play the game. Each group used the same folder throughout the playing, as it contained all the information sheets compiled during rounds of play. The game's rules were discussed by the author and questions answered. The following day, game playing began. At all times, the author and teacher of the class were present to answer questions and act as scorers. At the end of each round, the score would be calculated and an Unplanned Events card picked, then the score would be recorded on a sheet in the room.

Playing proceeded for thirteen consecutive school days, with fifty minutes per day being the playing time allotted. On the fourteenth day, the group discussions were held, as everyone had completed at least eight rounds of the game. The students divided into four groups, each comprised of those who had been working with the same profile person. Each of the four groups studied the decisions they had made for their person, and compared the results of those decisions. One member from each group was asked to report to the whole class.

The students were then asked to complete a questionnaire which asked them questions on specific pieces of information which the author felt were taught by the game. The last question, and the one whose results were analyzed, dealt with their personal feelings about the game experience and the information presented. They were asked to describe what they had learned and to comment on the game's effectiveness as ateaching tool. Suggestions for changes in the game were requested. The questionnaires were completed out of class and returned the following day.

The post-test, the Career Development Inventory Form III, was written by the experiemtnal and control groups the same day in class time, one day after the program was completed.

Description of the Life Career Game

The Life Career game was developed by Sarane S. Boocock while she was working at the John Hopkin's University with the Department of Social Relations. It was published by the Western Publishing Company in 1966, and is currently available through their School and Library Division. Boocock (1967) discussed the essentials of the game, the rules and procedures of the game, and results she has com-

piled through field testing. The game simulates several aspects of the labor market, the education market, and the marriage market, as they exist in the United States. The objectives of the game are : to give youth a feeling for the future, to give accurate information regarding life career alternatives, a sense of how a life cycle is patterned, and practice and skill in decision-making.

The game can be played by any number of teams of two to four players. Teams work with a profile of one fictitious person: four are given to choose from. Two are males, and two are females, each with different educational, sociability, and family role characteristics. Playing proceeds in rounds, each representing one year in the life of this person. A schedule of that person's activities for one week is planned. Time is allotted to school, studying, home responsibilities, a job, and leisure. Since most activities require a certain investment of time, training, and money, a person cannot engage in all the activities. The player's problem is to choose a combination of activities which maximizes their person's satisfaction and chances for a good future. For certain activities, including getting a job and higher education, applications must be accepted.

After players make their decisions for a year and have filled out a Schedule Form and a Record Sheet, scores are computed for each of the four areas - education, occupation, family, and leisure. Calculators use a set of tables and spinners, based on United States Census and survey data that indicate the probabilities of events occurring taking into account personal characteristics, past experiences, and present efforts. A chance factor is built in through the use of spinners and dice.

The game runs for a designated number of rounds, and the team with the highest score wins.

In this experiment, the game was revised slightly so it would better suit the Western Canadian scene. These changes included:

1. Use of the school's handbook of courses available at the high school level, in place of the school courses catalogue provided in the game kit.

2. Conversion from the American credit system to Alberta's system, which is based on credits given for a specified number of classroom hours. The requirements for a grade twelve diploma in Alberta are: 100 credits, pluss passing grades in specific courses as outlined by the Alberta Department of Education.

3. Use of University of Alberta calendars for course selection and admission requirements.

Description of Criterion Instrument

The Career Development Inventory is a self-administering paper-and pencil inventory for the measurement of vocational maturity. The first version, High School Form I, was developed in 1971, and since then, other versions have been developed. At present, there are three versions: High School Form I and III, College Form, and Adult Form. Form III of the High School version, used in this study, was devised in August of 1976, using items from Form I. It has six scales, these being:

1. Planning

2, Use of Resources

3. Career Decision-Making

4. Career Information

5. World of Work Information

6. Information about Preferred Occupation

The Form III requires about eighty minutes to complete.

The Career Development Inventory is completed, but not yet published. Development of adaptations and standardization work is underway in Brazil, Canada, England, France, Japan, Yugoslavia, the Netherlands, Poland, Portugal, Spain, Sweden, and Switzerland.

The creators of this measure include: Donald E. Super, David J. Forrest, Jean Pierre Jordaan, Richard H. Lindeman, Roger A. Myers, and Albert S. Thompson.

Development of Career Development Inventory

The beginnings of the CDI go back to the Career Pattern Study undertaken by the counseling psychology doctoral students and staff of Teacher's College at Columbia University to conceptualize the vocational maturity construct. A set of twenty indices hypothesized to constitute vocational maturity were developed. Data from 105 male 1951-52 ninth graders in Middletown, New York were analyzed. Intercorrelations of the twenty indices yielded six which were considered adequate measures of vocational maturity. Further factor analysis yielded four factors which defined vocational maturity as planning and looking ahead. The sample included socio-economically hetergeneous white and black students, white middle class students comprising the majority.

Forrest (1971) reported that a 267 item instrument from which the CDI eventually emerged was devised, including items from the 87 item Student Questionnaire (Thompson, Lindeman, Clack, Bohn, 1970). and successful items from the Career Pattern Study. A pilot study was conducted on sixty students in two sophomore English classes in Flint, Michigan in September of 1970, resulting in a revised 216 item, 13 scale instrument, the Career Questionnaire. This group of students were participating in the Educational and Career Exploration System, developed as a project of the Advanced Systems Development Division of IBM. The project was undertaken in the Genesse County Schools.

The Career Questionnaire was administered to a sample of 100 male and 100 female sophomores in the Flint, Michigan school system. Factor analysis yielded 93 items, reduced to 91, the Career Development Inventory. The inventory was then administered to a second group of 100 male and 100 female tenth graders, and the data was combined with the original standardization group to form norming groups.

Reliability

The test-retest method was used to measure response consistency. 82 tenth graders from four schools took the test a second time at intervals varying from two to four weeks, Reliabilities, as reported in the Preliminary Manual for Form I (Super and Forrest, 1972) for the three scales and total score were .85, .82, .71, and .87.

To measure stability, the CDI was administered in the late fall and again in May to the tenth graders. Coefficients of stability of scale scores range from .63 to .71.

Validity

Content Validity

The item content of the three factor-analytic derived CDI scales gave basis for the scale definitions and names. Scales A (Planning Orientation) and B (Resources for Exploration) were selected by the team of authors from theoretically derived and empirically refined scales used in previous studies. The decision-making and information items in Scale C were selected from items created for the earlier version and refined for psychometric and conceptual adequacy.

Criterion Related Validity

As vocational maturity is an age-related developmental variable, one relevant validity indicator is increase with age and experience. Scores should be stable over short time periods, but increase across age groups. Grade and age differences in CDI scores were studied by giving it to groups in the tenth and twelvth grades, in a high school and an eighth grade junior high group. A significant increase in scores across grade levels for the scales was found when a one-way analysis of variance was performed.

Construct Validity

Forrest (1971) reported that this was studied by examination of the realtionship of the scales to four relevant, but not necessarily

causal variables:

1. Rating of socio-economci level of father's occupation
2. Rating of student's vocational preference level
3. Grade point average for grade nine courses
4. Aptitude

These variables were correlated with CDI scores for 200 male and female tenth graders. Most correlations were statistically significant, but low. (Refer to the tables in Forrest, 1974, p. 59)

As there is no established measure of vocationalmaturity, it is difficult to compare the CDI to tests known to assess it. Forrest (1971), reported a comparison to the Career Maturity Inventory (Crites, 1965), Readiness for Career Planning Scale (Gribbons and Lohnes, 1969), and the Cognitive Vocational Maturity Test (Westbrook, 1967). High correlations of the two attitudinal scales and the cognitive scale of the CDI and the RCP scale were found plus a strong relationship between the cognitive scale and the CMVT.

The Career Development Inventory High School Form III was chosen as the criterion instrument for this study because of the following reasons:

1. It was developed by Donald E. Super, whose ideas on vocational ruidance and vocational maturity form the theoretical base of this study.
2. Various aspects of vocational maturity are covered by the CDI - planning, resource usage, career information, and decision-making.
3. It is an instrument which can be administered efficiently to groups of students in eighty minutes, making it appropriate for use

in high schools where most class periods are of this length.

Statistical Treatment

The statistical analysis used was the three-way analysis of variance (Group X Sex X Testing). For both groups, pre and post-test total scores were analyzed, as well as the pre and post-test scores of the six subscales.

CHAPTER IV

ANALYSIS AND FINDINGS

In this chapter the statistical analysis and findings of this study are presented. The discussion will center around the analysis used and proceed to examine the hypotheses and other findings.

Statistical Analysis

The purpose of the study was to examine the effects the Life Career game had on increasing the vocational maturity of the students involved in the program. The Career Development Inventory High School Form III was the criteria instrument used and scores on a pre and post-test which both the experimental and control groups took were obtained. The Inventory which was administered provided scores on six subscales plus a total test score.

The analysis used involved comparison of pre and post-test mean scores for each group and computation of three-way analysis of variance. Three variables were considered to be in need of examination and are listed below.

1. Variable A - Treatment Effect
   - Level I - Experimental
   - Level II - Control
2. Variable B - Sex of Subjects
   - Level I - Female
   - Level II - Male
3. Variable C - Test Scores on Criteria Measure
   - Level I - Pre-test
   - Level II - Post-test

The mean pre and post-test total scores of both the experimental and control groups are shown in Figure I. The total test scores are analyzed in Table 2, and in Tables 3 to 8 the six subscales of the CDI are analyzed.

The central question of this thesis deals with the effect of the treatment condition (the playing of Life Career) on the scores of the CDI. The following statistical hypotheses were generated in an attempt to answer this question.

Statistical Hypotheses

1. The Life Career game was designed to present vocational information and provide for experiences in decision-making skills. The students who experienced the program would be expected to achieve higher scores on a test to measure vocational maturity than those who experienced no such program.

Therefore, Hypothesis #1 states that there will be a significant main effect for treatment shown on the total test scores for the CDI.

2. No studies have been reported which have investigated the possibility of the CDI being a sex-biased instrument. The author, being interested in this issue, set out to have this concern answered.

Therefore, Hypothesis #2 states that there will be no significant main effect for sex on the total scores of the CDI as examination of the test does not reveal sex-biased items.

3. A learning effect appears to occur on vocational maturity tests, as evidenced by increases on post-test scores. This may be due to both discussion among students after the pre-testing situation

and retention of information gained through the taking of the pre-test.

Therefore, Hypothesis #3 states that pre and post-test score differences will show statistical significance for both groups.

Statistical Findings

1. Pre-test means between the experimental and control groups were not significant ($t = .14$; $df = 81$; $p > .20$), suggesting that the two groups were similar in their responses to the CDI. Following the experiment, however, significant main treatment effects were obtained ($F = 73.17$; $df = 1, 75$; $p < .00001$). These results indicate that whereas the experimental and control groups were similar in their initial performance on the CDI, the treatment condition had a significant effect on the post-test scores of the experimental group (Table 2).

2. No significant main effect for sex was obtained and, as well, there were no interaction effects. This suggests that the difference in pre and post-test scores was a function of the treatment procedures.

3. Analysis of the data (Table 2) indicates that pre and post-test total score differences were statistically significant ($F = 12.43$; $df = 1, 75$; $p = .0007$).

The results indicate that the treatment had an effect on the scores obtained on the CDI for the experimental group.

Other Findings

Data from the six subscales of the CDI were analyzed by means of a three-way analysis of variance (Group X Sex X Testing), the results

FIGURE I

MEANS FOR EXPERIMENTAL AND CONTROL GROUPS

ON THE CAREER DEVELOPMENT INVENTORY

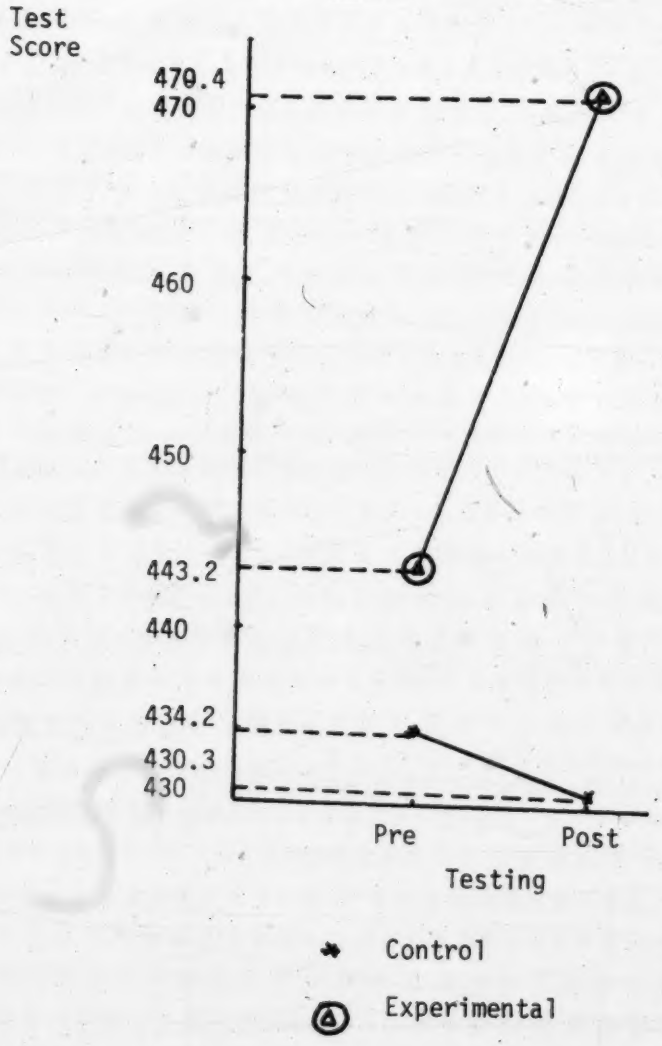

TABLE 2

ANALYSIS OF VARIANCE OF EFFECTS OF GROUP, SEX, AND TESTING

ON CAREER DEVELOPMENT INVENTORY TOTAL TEST SCORES

Source of Variance	MS	Df	F-Ratio	Probability
Group (A)	23849.8	1, 75	12.43	.0007 **
Sex (B)	6.76	1, 75	.0035	.95
Testing (C)	140395.0	1, 75	73.17	.0000 **
A X B	182.36	1, 75	.095	.76
B X C	45.76	1, 75	.023	.88
A X C	715.02	1, 75	.373	.54
A X B X C	169.89	1, 75	.089	.76

**indicates $p < .01$

TABLE 3

ANALYSIS OF VARIANCE ON SUBSCALE I "PLANNING"

OF THE CAREER DEVELOPMENT INVENTORY

Source of Variance	MS	Df	F-Ratio	Probability
Group (A)	706.66	1, 75	3.16	.079
Sex (B)	858.54	1, 75	3.84	.054
Testing (C)	17497.3	1, 75	78.22	.0000 **
A X B	17.43	1, 75	.07	.78
B X C	249.57	1, 75	1.12	.29
A X C	11.8	1, 75	.05	.81
A X B X C	54.29	1, 75	.24	.62

** $p < .01$

TABLE 4

ANALYSIS OF VARIANCE ON SUBSCALE II "USE OF RESOURCES"

OF THE CAREER DEVELOPMENT INVENTORY

Source of Variance	MS	Df	F-Ratio	Probability
Group (A)	15354.2	1, 75	13.97	.0003 **
Sex (B)	125.49	1, 75	.114	.74
Testing (C)	72490.8	1, 75	65.96	.0000 **
A X B	204.07	1, 75	.186	.67
B X C	94.98	1, 75	.086	.77
A X C	1.23	1, 75	.001	.97
A X B X C	1327.4	1, 75	1.21	.28

** $p < .01$

TABLE 5

ANALYSIS OF VARIANCE ON SUBSCALE III "CAREER DECISION-MAKING"

OF THE CAREER DEVELOPMENT INVENTORY

Source of Variance	MS	Df	F-Ratio	Probability
Group (A)	106953.0	1, 75	1.39	.24
Sex (B)	120435.0	1, 75	1.56	.21
Testing (C)	6322.4	1, 75	.08	.78
A X B	527605.0	1, 75	6.85	.01 *
B X C	45037.5	1, 75	.58	.45
A X C	63986.8	1, 75	.83	.36
A X B X C	21516.8	1, 75	.28	.59

* $p < .05$

TABLE 6

ANALYSIS OF VARIANCE ON SUBSCALE IV "CAREER INFORMATION"

OF THE CAREER DEVELOPMENT INVENTORY

Source of Variance	MS	Df	F-Ratio	Probability
Group (A)	153.57	1, 75	12.15	.0008 **
Sex (B)	262.08	1, 75	20.73	.0000 **
Testing (C)	647.32	1, 75	51.21	.0000 **
A X B	7.98	1, 75	.63	.43
B X C	77.78	1, 75	6.15	.01 *
A X C	241.43	1, 75	19.11	.0000 **
A X B X C	17.53	1, 75	1.39	.24

* $p < .05$

** $p < .01$

TABLE 7

ANALYSIS OF VARIANCE ON SUBSCALE V "WORK INFORMATION"

OF THE CAREER DEVELOPMENT INVENTORY

Source of Variance	MS	Df	F-Ratio	Probability
Group (A)	.003	1, 75	.0002	.99
Sex (B)	71.23	1, 75	3.82	.05
Testing (C)	275.49	1, 75	14.77	.0003 **
A X B	1.35	1, 75	.07	.79
B X C	11.61	1, 75	.62	.43
A X C	20.67	1, 75	1.11	.29
A X B X C	2.46	1, 75	.13	.72

** $p < .01$

TABLE 8

ANALYSIS OF VARIANCE ON SUBSCALE VI "PREFERRED OCCUPATION INFORMATION" OF THE CAREER DEVELOPMENT INVENTORY

Source of Variance	MS	Df	F-Ratio	Probability
Group (A)	49.28	1, 75	3.13	.08
Sex (B)	.74	1, 75	.05	.83
Testing (C)	391.59	1, 75	24.85	.0000 **
A X B	39.18	1, 75	2.49	.12
B X C	1.09	1, 75	.07	.79
A X C	7.12	1, 75	.45	.50
A X B X C	12.75	1, 75	.81	.37

** $p < .01$

of which appear in Tables 3 to 8. The discussion of these results follows.

An examination of Subscale I "Planning" (Table 3) revealed a significant main testing effect ($F= 78.22$; $df= 1, 75$; $p < .00001$).

Analysis of Subscale II "Use of Resources" (Table 4) revealed a significant treatment effect ($F= 65.96$; $df= 1, 75$; $p < .00001$).

Analysis of Subscale III "Career Decision-Making" (Table 5) revealed an interaction effect between treatment and sex ($F= 6.85$; $df= 1, 75$; $p= .01$).

Several significant main effects were found in Subscale IV "Career Information" (Table 6). A significant treatment effect was found ($F= 51.21$; $df= 1, 75$; $p < .00001$). A significant main effect for sex was found ($F= 20.73$; $df= 1, 75$; $p < .00001$). Significant interaction effects were found: between treatment and testing ($F= 19.1$; $df= 1, 75$; $p < .00001$) and between sex and testing ($F= 6.15$; $df= 1, 75$; $p= .01$).

An examination of Subscale V "Work Information" (Table 7) revealed that there was a significant main testing effect ($F= 14.77$; $df= 1, 75$; $p= .0003$).

On Subscale VI "Preferred Occupation Information" (Table 8) a significant main testing effect was found ($F= 24.85$; $df= 1, 75$; $p < .00001$).

Questionnaire Data: Upon completion of the Life Career game program, participants were asked to complete an evaluation of their experience. The question asked of them was:

> "Give your personal evaluation of this game, describing your personal experience with it, the specific portions you would change, and those you would keep, giving reasons for the decisions."

Written answers were collected by the author and comments on the specific positive and negative aspects of the game recorded in Appendix B. The simulation game appeared to be an enjoyable learning experience for the students.

Summary of the Results

A three-way analysis of variance (Group X Sex X Testing) was performed on the total test scores of the eighty-three subjects. The .05 level of significance was deemed necessary for the rejection of the hypotheses.

The results may be summarized as follows:

1. There is no significant difference between groups on pre-test scores.

2. The experimental group's post-test total score on the CDI is significantly higher than the score of the control group.

3. Pre and post-test total test scores on the CDI are significantly different over both groups.

4. There is no significant difference between male and female total test scores on the CDI.

The results indicate that the treatment (playing the Life Career Game) had an effect on the scores obtained by the experimental group.

The three-way analysis of variance (Group X Sex X Testing) was performed on each of the six subscales of the CDI and the results may be summarized as follows:

1. On Subscale I "Planning", there is a significant main effect for testing.

2. On Subscale II "Use of Resources", there is a significant

main treatment effect.

3. On Subscale III "Career Decision-Making", an interaction effect was found between treatment and sex.

4. On Subscale IV "Career Information", there are significant main effects for treatment and for sex. Interaction effects were found between treatment and testing, and between sex and testing.

5. On Subscale V "Work Information", there is a significant main testing effect.

6. On Subscale VI "Preferred Occupation Information", there is a significant main testing effect.

The questionnaire distributed to the participants in the experimental group asked for their personal evaluation of the game and experience with it. Specific comments and criticisms appear in Appendix B. The sessions with Life Career appear to have been enjoyed and were considered learning experiences.

CHAPTER V

CONCLUSIONS AND IMPLICATIONS

The purpose of this study was to investigate the use of the Life Career game as a tool to aid in the teaching of skills involved in vocational decision-making. In order to field test this game, forty-five grade eleven students participated in playing it for a period of thirteen fifty-minute periods. The assessment of change in vocational maturity was made by using the Career Development Inventory High School Form III as the pre and post-test measure. The scores of the experimental group were compared to those obtained by the thirty-eight grade eleven members of the control group who did not participate in game playing. The following conclusions were reached by an analysis of scores obtained.

Conclusions

It seems evident that the Life Career game is an effective tool to use in the teaching of vocational decision-making skills. A comparison of mean total scores for each group at the time of the pre-test found the difference between the control and experimental group to be insignificant.

However, the three-way analysis of variance revealed that significant increases in the post-test total scores were obtained by the experimental group.

Further investigation of the results from each of the six subscales of the CDI revealed some interesting findings. Only Subscale II "Use of Resources" and Subscale IV "Career Information" revealed

significant differences between groups in post-test scores. This leads to the conclusion that these two areas are ones which the game stresses over other possible areas such as: planning for a career, general work information, or preferred work information.

The questionnaire responses of the experimental group indicated that participation in the playing of Life Career was an enjoyable experience, and one which provided many insights into the complexity of future planning coupled with the flexibility required of them in their planning. Numerous suggestions were made as to how the game might be improved so as to better suit the Western Canadian scene and the reality of current situations in terms of the expected salaries and available jobs. These suggestions indicated that much thought was given to future planning throughout the eight rounds of play. (See Appendix B for comments.)

Group behavior was noted by the author throughout the sessions. The questions asked of the leaders involved increased in number and complexity as the playing continued. Interest in the activity remained at a high level, and it appeared that their motivation to perform well on the post-test was higher than that shown by the control group. That is, the interest in the subject continued on into the testing situation.

Suggestions made by participants indicated that for optimal effectiveness the game should undergo revisions appropriate for the area where it will be used. For example: the course guide and college calendars for the high school and colleges in the immediate area would be more appropriately used than those booklets provided for in the game kit.

The game appeared to provide a learning situation, one in which vocational information is presented and further exploration of career planning through the use of other resources is encouraged.

Implications for Further Research

In terms of further research, the following implications exist:

1. A larger sample of high school students drawn randomly from the total population should be studied to determine whether the findings from this study are general.

2. The criterion instrument used to test for changes in vocational maturity, the Career Development Inventory High School Form III, should undergo further use in program evaluation so its reliability and validity can be compared to other instruments currently available.

3. The results of a program where only the Life Career is used, as in this study, should be compared to one in which other methods are used to communicate the same information. Other methods might include the use of films, lectures, and speakers employed in various occupations.

4. The Use of Life Career should be teamed with the use of other tools such as films and lectures, with the results obtained compared to those when only the game is played.

Summary Statement

Programs such as this should be incorporated into the high school to a greater degree. As has been mentioned, Life Career could be used

in a variety of classrooms with revisions having to be made only in the introduction to the class of the purpose of its use. This would involve the staff and students in the processes of future planning, while taking a great workload off the counselor who now becomes more available as a resource person to provide specific information regarding vocations. The counselor also has more time available to work with students in resolving personal issues.

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APPENDIX A

Copies of Career Development Inventory

High School Form III, Booklets I and II

PREVIOUSLY COPYRIGHTED MATERIAL,

IN APPENDIX A, LEAVES 60 - 96,

NOT MICROFILMED.

CAREER DEVELOPMENT INVENTORY, Junior and Senior High School Form III, Modular, PARTS I - VI, by Donald E. Super and David J. Forrest, Jean Pierre Jordaan, Richard H. Lindeman, Roger A. Myers, Albert S. Thompson, Teachers College, Columbia University, New York, New York, U.S.A. Copyright 1976.

Answer Sheets to the above.

Occupational Group Preference Form.

APPENDIX B

QUESTIONNAIRE RESPONSES

Page 60-96
NOT FILM.

APPENDIX B

Questionnaire Responses

The responses of the participants in the program were organized into two parts: positive comments and suggestions for change. The number in parenthesis which follows each comment indicates the number of times the same comment was made.

Positive Comments

1. The game makes the player realize that future plans must be flexible as unplanned events do occur. (3)

2. I liked the spinner to determine whether a job was landed, or if you could get married, for example, because some things are full of chance. (1)

3. Planning someone else's life is difficult, but it makes you think about your own plans. (2)

4. The game taught me about my future and the possible events which may occur. (2)

5. When planning for the future, you have to realize that it is your life and how you plan it will determine how you will live. (1)

6. It gives a good indication of the various choices you have. (2)

7. The game gives good experience in overseeing a life. It can show where a person has gone wrong and also what the good decisions were for him. (1)

8. It made me aware of the decisions I will have to make. (2)

9. It gave me a good idea of the importance of education for various jobs. (2)

10. I feel I now have a firmer grip on planning my life. It's a benefit to those who have not thought about the future. (3)

11. The use of our high school guide made it more realistic. (4)

12. I got more involved with it every round we played. (3)

13. I like the unexpected: losing the job, failing a course; it would have been boring otherwise because plans don't always work out. (2)

14. It was interesting, but boy, really frustrating. (1)

15. The game was worthwhile as it gave us the opportunity to look at one person's life and plan it while at the same time we were loo-ing through booklets that were able to let us see different occupations you can go into with so much education. (1)

16. It makes you really want to set goals for yourself and work at getting them. (2)

17. The game had most benefit if you could play it as if he/she was you. (2)

Criticisms and Suggestions for Change

1. Update the salaries every two years. (6)

2. There are two sexist rules that should be changed: the 25 hours of housework for married females, and the rule for 60 hours of housework for females with children. Why aren't the men helping? (3)

3. Include more modern unplanned events to deal with such issues as: child born with disability, divorce, unemployability,

accident. (3)

4. Have room and board charged once the profile person reaches eighteen, if he/she is still at home, but working. (1)

5. Make scoring for grades less up to luck on spins. Improve the method. (10)

6. If you get married, you should have to plan the other person's life, too. (1)

7. Change the housework rule. Nobody does that much per week. (5)

8. Place stress on budgeting: rent, food, clothing, leisure, rather than just figuring out a lump sum of net earning available for spending. (3)

9. I would like more information on the profile person. (1)

10. I would like to have also had lectures, pamphlets, films, in addition to the game. (2)

11. Canadians don't have the draft, so remove that unplanned event card. (1)

12, A person working shouldn't necessarily get more points than a person choosing to remain in school. (2)

13. Increase the size of the newspaper to allow for wider job choice. (2)

14. I found it surprising that you could get higher points one round for dropping out of school an getting married, and then lower scores for going back to school. (1)

15. There was not enough variety of part-time jobs offered. (1)

APPENDIX C
EXAMPLE OF VOCATIONAL MATURITY LEVELS

APPENDIX C

Example of Vocational Maturity Levels

An example of the behaviors which would enable an observer to note differences between a sixteen year old with a high level of vocational maturity and one with a low level of maturity are given below.

A sixteen year old who exhibited a high degree of vocational maturity would have moved beyond the exploration area into crystalliztion in Super's terms. He would have narrowed down his vocational choices to ones which are more solidly based upon reality as it exists for him. His choices will now be based on his experiences in related school subjects, on his financial standing, and knowledge of the area he wished to enter. He would be able to verbally express his vocational choices and goals giving a rationale for each choice based on reality. He would be able to discuss the investigative activities undertaken to learn more about his interest area.

A sixteen year old who exhibited a low level of vocational maturity would be working from a base in fantasy, not reality. He would probably be at the exploration stage, unable to move beyond this until he is aware that various factors should be considered before specific choices are made. Therefore, he would be unable to verbally express his possible future vocational choices.

APPENDIX D

SEX DIFFERENCES IN PRE AND POST-TEST MEAN TOTAL TEST SCORES

APPENDIX D

Sex Differences in Pre and Post-Test Mean Total Test Scores

ZERO SCORES ARE INCLUDED IN CALCULATIONS

OUTPUT FOR GROUP 1 (FEMALE EXPERIMENTAL GROUP MEMBERS)

	SAMPLE SIZE	MAXIMUM VALUE	MINIMUM VALUE	GROUP SUM	SUM OF SQUARES	GROUP MEAN	VARIANCE	STANDARD DEVIATION
VARIABLE 1	25	131.000	52.000	2410.00000	242120.000	96.720	330.040	18.1672
VARIABLE 2	25	345.000	165.000	6510.00000	174020[illegible].00	260.400	1803.78	42.4764
VARIABLE 3	25	24.000	7.000	468.000000	9032.00000	18.720	13.2423	3.63899
VARIABLE 4	25	29.000	17.000	598.000000	14522.0000	23.920	8.71374	2.95190
VARIABLE 5	25	28.000	11.000	504.000000	10596.0000	20.160	17.1749	4.14426
VARIABLE 6	25	30.000	13.000	558.000000	12420.0000	22.320	16.6141	4.07487
VARIABLE 7	25	566.000	284.000	11101.0000	5022579.00	444.040	3751.05	61.2489
VARIABLE 8	25	146.000	52.000	2588.00000	2788[illegible].000	103.520	487.133	20.9077
VARIABLE 9	25	356.000	187.000	7003.00000	2011[illegible].00	280.120	1966.11	44.3405
VARIABLE 10	25	20.000	8.000	525.000000	11469.0000	21.000	17.7600	4.21426
VARIABLE 11	25	29.000	20.000	612.000000	15152.0000	24.480	6.[illegible]998	2.45153
VARIABLE 12	25	26.000	13.000	495.000000	10081.0000	19.800	11.2000	3.34674
VARIABLE 13	25	30.000	13.000	545.000000	12459.0000	21.800	23.1267	4.80900
VARIABLE 14	25	576.000	344.000	11768.0000	5648818.00	470.720	4375.47	66.1473

OUTPUT FOR GROUP 2 (MALE EXPERIMENTAL GROUP MEMBERS)

	SAMPLE SIZE	MAXIMUM VALUE	MINIMUM VALUE	GROUP SUM	SUM OF SQUARES	GROUP MEAN	VARIANCE	STANDARD DEVIATION
VARIABLE 1	20	136.000	59.000	1994.00000	20[illegible]94.000	99.700	464.[illegible]14	21.5[illegible]9
VARIABLE 2	20	363.000	215.000	5326.00000	14[illegible]36.00	266.400	1812.92	42.[illegible]235
VARIABLE 3	20	23.000	12.000	360.000000	6628.00000	18.000	7.[illegible]000	2.7[illegible]5
VARIABLE 4	20	27.000	12.000	396.000000	8238.00000	19.800	15.[illegible]05	3.[illegible]11[illegible]
VARIABLE 5	20	27.000	7.000	366.000000	7[illegible]60.00000	18.300	29.1100	5.[illegible]5[illegible]
VARIABLE 6	20	28.000	15.000	401.000000	8[illegible]5.00000	20.050	19.2450	4.[illegible]e7.[illegible]
VARIABLE 7	20	571.000	308.000	8[illegible]45.00000	397[illegible]19.00	442.250	3[illegible].[illegible]	5[illegible].[illegible]171
VARIABLE 8	20	147.000	71.000	2283.00000	2[illegible]9133.000	114.150	4[illegible].[illegible]31	[illegible].[illegible]502
VARIABLE 9	20	366.000	211.000	5627.00000	1[illegible]3[illegible]31.00	281.350	2[illegible]3.[illegible]	51.[illegible]157
VARIABLE 10	20	23.000	9.000	345.000000	6225.00000	17.250	13.[illegible]875	3.[illegible]960
VARIABLE 11	20	27.000	12.000	404.000000	8[illegible]0.00000	20.200	15.[illegible]32	3.[illegible]50[illegible]
VARIABLE 12	20	28.000	9.000	344.000000	6470.00000	17.200	27.[illegible]602	5.[illegible]249
VARIABLE 13	20	30.000	11.000	423.000000	9483.00000	21.150	26.[illegible]28[illegible]	5.[illegible]557
VARIABLE 14	20	596.000	370.000	9427.00000	4521233.00	471.350	3[illegible]91.[illegible]2	[illegible]2.[illegible]7[illegible]

OUTPUT FOR GROUP 3 (FEMALE CONTROL GROUP MEMBERS)

	SAMPLE SIZE	MAXIMUM VALUE	MINIMUM VALUE	GROUP SUM	SUM OF SQUARES	GROUP MEAN	VARIANCE	STANDARD DEVIATION
VARIABLE 1	24	131.000	52.000	2329.00000	2343[illegible]1.000	97.042	348.793	18.[illegible]78[illegible]
VARIABLE 2	24	351.000	205.000	6407.00000	174[illegible]45.00	266.958	1347.60	36.7[illegible]97
VARIABLE 3	24	25.000	7.000	458.000000	9078.00000	19.083	14.[illegible]7[illegible]7	3.751[illegible]9

Group 3 continued

VARIABLE 4	24	28.000	5.000	529.000000	12193.0000	22.042	22.2072	4.71.45
VARIABLE 5	24	29.000	5.000	457.000000	9323.00000	19.042	25.6739	5.06663
VARIABLE 6	24	28.000	10.000	477.000000	9853.00000	19.875	15.5260	3.94031
VARIABLE 7	24	529.000	339.000	10657.1000	47.49057.00	444.042	2371.23	48.6453
VARIABLE 8	24	142.000	54.000	2322.00000	234216.000	96.750	396.435	19.9009
VARIABLE 9	24	339.000	180.000	6297.00000	1647751.00	262.375	1899.00	43.5775
VARIABLE 10	24	25.000	14.000	466.000000	9234.00000	19.417	10.2437	3.20057
VARIABLE 11	24	28.000	9.000	534.000000	12362.0000	22.250	20.0208	4.47446
VARIABLE 12	24	26.000	9.000	466.000000	9454.00000	19.417	16.9103	4.11221
VARIABLE 13	24	27.000	10.000	490.000000	10394.0000	20.417	16.2435	4.03032
VARIABLE 14	24	539.000	309.000	10553.0000	47180e7.00	439.708	3242.61	56.9457

OUTPUT FOR GROUP 4 (MALE CONTROL GROUP MEMBERS)

	SAMPLE SIZE	MAXIMUM VALUE	MINIMUM VALUE	GROUP SUM	SUM OF SQUARES	GROUP MEAN	VARIANCE	STANDARD DEVIATION
VARIABLE 1	14	138.000	59.000	1445.00000	156703.000	103.214	539.060	23.2255
VARIABLE 2	14	324.000	140.000	3453.00000	873747.000	246.643	1577.80	39.7216
VARIABLE 3	14	26.000	13.000	261.000000	5053.00000	18.643	13.3727	3.65666
VARIABLE 4	14	28.000	18.000	317.000000	7257.00000	22.643	5.05841	2.24874
VARIABLE 5	14	24.000	7.000	232.000000	4184.00000	16.571	18.5576	4.30647
VARIABLE 6	14	26.000	0.0	213.000000	3978.00000	15.571	42.5879	6.51656
VARIABLE 7	14	524.000	342.000	5941.00000	2563277.00	424.357	3569.61	59.7553
VARIABLE 8	14	145.000	72.000	1511.00000	1e4Re7.000	107.929	413.456	20.3312
VARIABLE 9	14	290.000	163.000	3831.00000	0540?5.000	285.071	941.762	30.6884
VARIABLE 10	14	24.000	6.000	225.000000	3947.00000	16.071	23.0360	4.80199
VARIABLE 11	14	27.000	6.000	257.000000	5693.00000	18.357	63.2491	7.95173
VARIABLE 12	14	24.000	3.000	216.000000	3871.00000	15.643	31.0610	5.57324
VARIABLE 13	14	25.000	12.000	249.000000	4595.00000	17.786	11.8830	3.44717
VARIABLE 14	14	402.000	332.000	5892.00000	2510328.00	420.857	2188.64	46.7749

PRE-TEST RESULTS - VARIABLES 1 to 7 inclusive

POST-TEST RESULTS - VARIABLES 8 to 14 inclusive

The information contained on the tables of the two previous pages refers to the following:

Variable 1 - Subscale 1 "PLANNING" Pre-test

Variable 2 - Subscale 2 "USE OF RESOURCES" Pre-test

Variable 3 - Subscale 3 "CAREER DECISION-MAKING" Pre-test

Variable 4 - Subscale 4 "CAREER INFORMATION" Pre-test

Variable 5 - Subscale 5 "WORLD OF WORK INFORMATION" Pre-test

Variable 6 - Subscale 6 "INFORMATION ABOUT PREFERRED OCCUPATION" Pre-test

Variable 7 - Pre-test total test score

Variable 8 - Subscale 1 "PLANNING" Post-test

Variable 9 - Subscale 2 "USE OF RESOURCES" Post-test

Variable 10 - Subscale 3 "CAREER DECISION-MAKING" Post-test

Variable 11 - Subscale 4 "CAREER INFORMATION" Post-test

Variable 12 - Subscale 5 "WORLD OF WORK INFORMATION" Post-test

Variable 13 - Subscale 6 "INFORMATION ABOUT PREFERRED OCCUPATION" Post-test

Variable 14 - Post-test total test score

Group 1 - Female Experimental Group Members

Group 2 - Male Experimental Group Members

Group 3 - Female Control Group Members

Group 4 - Male Control Group Members